



INSTRUCTION MANUAL

DAFM3

Digital Air Flow Meter



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Introduction

The DAFM3 Anemometer/Psychrometer meter is designed with 6 HVAC/R must have parameters in one instrument. These are included in a portable battery operated instrument for measuring Humidity, Air temp., Dew Point, Wet Bulb, Air Velocity and Air Volume. The sensor is built into the remote fan and is specially protected by a twist cap. While in operation, open the cap for accurate temperature and humidity readings.

Features include

- Measures Air Velocity, Temperature and Humidity
- Calculate Wet Bulb, Dew Point, and Air Volume (CFM, CMM)
- Protective twist cap for temperature/humidity sensor
- 8-Point Average for Air Velocity
- 60 Second Average for Air Volume
- Total Volume from multiple outlets
- Large LCD digital display
- Professional remote vane
- English/Metric scales
- Low battery indication
- Fast response
- Microprocessor circuitry for reliability
- Auto Power Off selectable
- Powered by 4 "AAA" batteries

Features include

- DAFM3 Anemometer/Psychrometer Meter
- Remote Vane
- Batteries (4)
- User manual
- Hard carrying case

Safety Notes

Before using this meter, read all safety information carefully. In this manual the word "**WARNING**" is used to indicate conditions or actions that may pose physical hazards to the user. The word "**CAUTION**" is used to indicate conditions or actions that may damage this instrument.

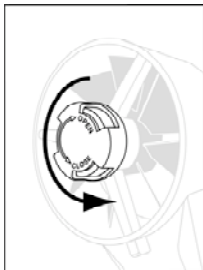


CAUTION!

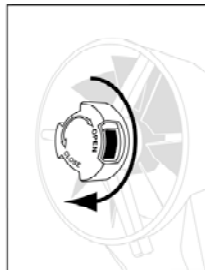
Objects striking the fan may damage meter.

LCD Display Functional Description

1. Rotate the protective cover in the center of the fan to open before measurement to ensure the measured data is correct.



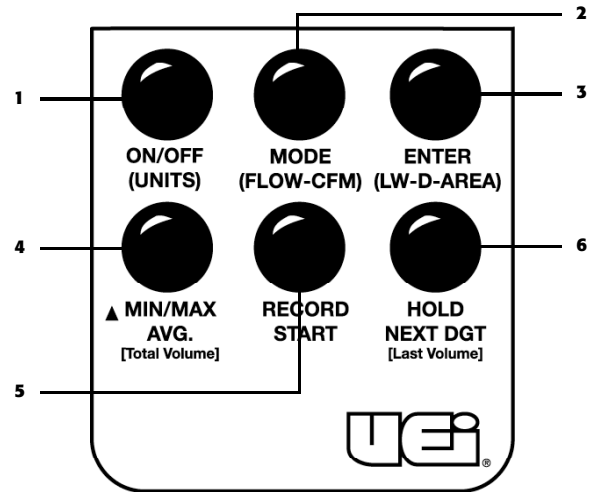
CLOSED



OPEN

2. The fan and meter are sold as a kit and are calibrated to each other. Please don't connect the fan with another DAFM3 or other similar anemo-psychrometers because the characteristic of each fan is different.

Controls and Indicators



1. **ON/OFF:** Turns ON the meter with auto-sleep mode. Turns OFF the meter at any mode.
NOTE: When the meter is OFF, press more than two seconds to enter "**UNITS**" selection.
2. **MODE:** Press to select different modes (Temp, DP, WB, RH, Velocity). Press and hold to select "**VOLUME**" function.
3. **ENTER:** To confirm the setting and calibration. Press and hold to select the method to enter "**AREA** for **VOLUME**".
Length/Width (LW) for open rectangular duct, Diameter (D) for open round ductwork, and Area (A) to enter the specified grill free area (Ak) information.
NOTE: Also used to recall values stored in memory for multi-point average.
4. **MIN/MAX/AVG and UP:** Press to view Minimum, Maximum, and Average value.
 - To increase digit during setup for volume.
 - To view total of measured volume on multiple outlets.
5. **REC/START:** In velocity mode, pressing this key to store the current velocity reading into memory.
 - To start measuring volume without waiting to finish countdown in "**Volume**" mode.
6. **HOLD/NEXT Dgt:** In basic modes press this key to hold the current reading, then press this key again to unlock the held reading.
 - To select next digit during setup for volume.
 - View last measured air volume.

Operating Instructions

Disable Auto Power Off

With the meter off, press and hold "MIN/MAX" then press and hold "ON/OFF" until the meter beeps.

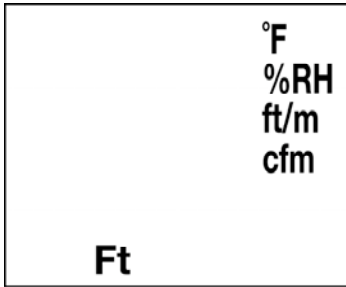
Selecting Units

With the meter off press and hold the "ON/OFF" button for more than two seconds. The display will show only the units portion.

Use the "UP" or "NEXT Dgt" buttons to alternate between the available scales. When the scale desired is showing press the "ENTER" button to save. The units available are Ft, in, cm.

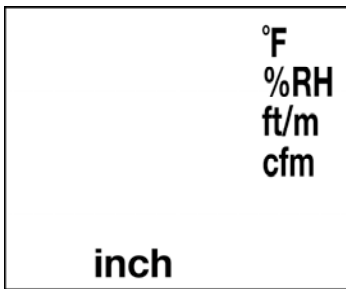
Ft Range

Select these units to enter free area specification from grill manufacture. Free Area is not a calculated area based on grill dimensions, but accounts for the space between louvers. It is often referred to as Ak, or effective area. The following figure represents these units.



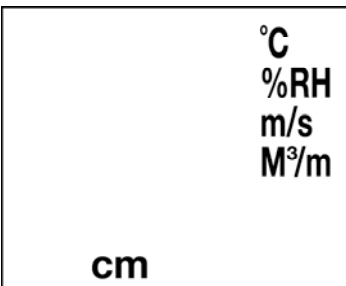
INCH

Select these units if measuring open ductwork and you wish to enter the length and width or diameter in inches. It can also be used to enter specified grill free area provided by manufacture in square inches for the Ak number.



CM

Select these units for metric scales. The temperature is °C, and velocity and volume are in meters per second and cubic meters per minute.



Basic Measurement

When you first turn the unit on the air temperature is the default value to show on the LCD. To review the other basic parameters, just press the "MODE" key. Each parameter will be displayed in turn.

Parameters Measured will cycle through the following in order

- Dry Bulb Temperature
- Dew Point Temperature (DP)
- Wet Bulb Temperature (WB)
- Relative Humidity (RH%)
- Air Velocity

MIN/MAX/AVG

All modes will capture the average (AVG), minimum (MIN) and maximum (MAX) value since the meter was powered on. Select AVG/MIN/MAX by pressing this button. Pressing "MODE" while displaying "MIN/MAX" or "AVG" will scroll through available readings. Each mode will also provide a choice of MIN/MAX or AVG.

Velocity with Average

The DAFM3 has the ability to capture up to eight values for velocity, and then display the minimum, maximum and average of these readings.

The maximum number of records is 8 points.

1. Store readings while in the measurement mode by pressing "RECORD" (up to 8 points of data).
2. Press "ENTER" to view results.
NOTE: "REC H" will display in the lower left of the display.
3. Press "MIN/MAX/AVG" to cycle through the calculated values.



Air Volume Note

The DAFM3 will also calculate air volume for supply or return air flow. The meter will measure velocity and then utilize the area entered to calculate volume.

The critical aspect of this function is to have the correct area. There are three methods used to enter area, but consider the following.

Dimensional outlet size can only be used on ductwork that does not have a grill over the opening. The louvers and frame on the grill reduce the effective open area so that the space available for airflow is less than what the outside dimensions would calculate.

As an example a 12" x 12" grill would equal one square foot (length x width, 1 ft x 1 ft = 1 sq foot), but with the fins of the grill in that space it may only have an effective area of 0.5 square feet or less. Grill manufacturers perform testing to evaluate the effective area of a grill, and considers not only the space between the grill, but the pressure created by the air flowing against these fins.

For the most accurate results, please obtain the effective area or free area from the grill manufacture. This is often listed as the Ak value.

Air Volume Measurement

While in basic mode, press "**MODE**" for over 2 seconds to enter volume measurement mode. Press and hold "**MODE**" for more than 2 seconds to return to basic mode.

The steps to capture volume on open ductwork are the following:

1. Enter the free area.
 - a) Use dimensions for open ductwork.
 - Length and width for rectangular ductwork
 - Diameter for circular ductwork
 - b) Use the manufacture value for effective or free area (Ak).
2. Hold the air vane in the air flow area and press "**START**".
3. Move the air vane slowly over the entire face or open area during the 60 second countdown.
4. View the results after the meter emits a beep (the end of the 60 second sample time).

To repeat this on additional registers press and hold "**ENTER**" to return to step 1.

Additional outlets can be measured and then the total of all measurements can be viewed. After measuring the volume, and while displaying the result, press the "**[Total Volume]**" button. It will list the number of tests in the upper left and the total volume. Return to the results of the last test by pressing "**[Last Volume]**".

Entering Free Area

There are three methods to enter the area used to calculate volume. The units also change the numbers that would be entered.

The three methods are Length and Width (LW) for rectangular ducts, Diameter (D) for circular ducts, and AREA to enter in the grills free area specification from the manufacture.

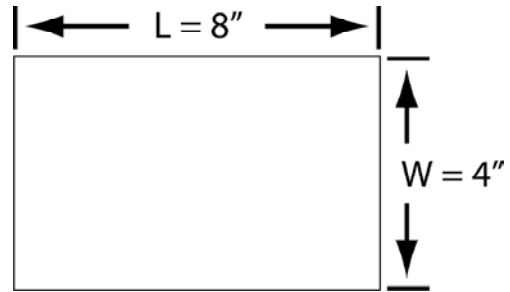
Units will determine what values are entered.

- Use "**IN**" for open grills and when manufacture specifications provide square inches for the effective area.
- Use "**Ft**" for Ak numbers provided in square feet.

NOTE: LW and D inches can be converted to feet by dividing by 12.
- Use the "**CM**" scale to obtain cubic meters per minute and when grill specifications are in square centimeters for free area.

• Length and Width

This is the default choice when entering the volume mode, and will start with entering the length. You can determine that the meter is in this mode with the L in the lower left corner.



NOTE: To convert dimensions in inches to feet divide by 12. On the above image 8" length ÷ 12" = .667 Ft for L, and 4" width ÷ 12" = .333 Ft for W.

Press the "**UP**" key to increase the value of the flashing digit. Press the "**NEXT Dgt**" key to select the next digit. You can cycle through all of the digits until the correct value has been entered. Press "**ENTER**" when the correct length has been selected. This will advance you to the width mode (W in the lower left portion of the display).

Press the "**UP**" key to increase the value of the flashing digit, and then "**NEXT Dgt**" to select the next digit. After you have the correct value press "**ENTER**" to advance to the measurement mode for volume.

NOTE: The meter will provide a 20 second countdown so you can position the air vane near the grill or opening. If you do not need the entire 20 seconds simply press "**START**".

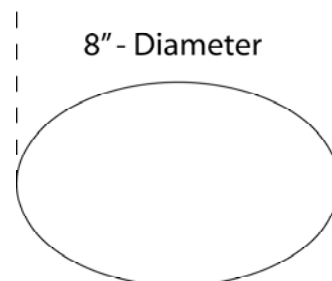
The meter will average the measurement over a 60 second time-frame. Continue to move the air vane across the entire area being measured to obtain the most accurate value. The meter will beep at the end of the test, and the display will hold the volume measured.

Press "**ENTER**" to repeat the volume test on additional registers or openings. The meter will return to the LW area enter mode, but will retain the last entered values. If measuring a round duct or specific grill press and hold "**ENTER**" to advance to the alternative area modes

• Diameter

The second option is using diameter of the duct.

After entering the Volume Mode, press and hold "**ENTER**" to advance to the diameter entrance mode. You can confirm this by observing the "**D**" in the lower left area of the display. Enter the correct value using the same method listed for Length and Width values.



NOTE: 8" diameter duct. If entering diameter in "**Ft**" scale divide diameter by 12. (8 ÷ 12 = .667 feet)

• **Area**

While in diameter setting mode, press the “**ENTER**” key for over two seconds to enter area setting.

Enter the specified grill free area obtain from the manufacture using the “**UP**” key to increase the value of the flashing digit, and the “**NEXT Dgt**” key to move to the next digit. Press “**ENTER**” after the correct value has been selected.

Air Volume: Measurement

After pressing “**ENTER**” to exit the size mode the meter waits 20 seconds to provide time for you to put the vane up to the grill. During the 20 second waiting time a countdown timer is displayed on top left corner. The meter beeps when time is up. To skip the 20 second countdown press “**START**” when ready.

The meter measures the volume for 60 seconds and calculates the average. During this 60 second time, the vane should be moved along the entire outlet area. The count down timer displayed on the top left corner will show remaining time. The meter beeps when 60 seconds are completed.

At the end of the 60 second countdown the meter will show the measured volume. To measure additional outlets press the “**ENTER**” key to repeat the procedure (This will return you to the area entrance screen for LW).

Total volume of all measurements is displayed by pressing the “**MIN/MAX/AVG**” key after completing the above test. You can return to the last value measured by pressing the “**HOLD/DOWN**” key. With the last value displayed you can repeat the test for additional outlets, adding to the total already measured.

Exiting the volume measurement mode will reset the total stored value.

Low-Battery

Two level battery indication:

Level 1: Battery indicator will flash at level 1. In this situation, the meter will work normally, however users should prepare to replace the batteries.

Level 2: Battery indicator will always display on the LCD. In this level change batteries immediately.

Maintenance

Periodic Service



WARNING!
Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the meter. This could alter the protection from electrical shock and personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

Cleaning

Periodically clean your meter’s case using a damp cloth. **DO NOT** use a brasive, flammable liquids, cleaning solvents, or strong detergents as they may damage the finish, impair safety, or affect the reliability of the structurd components.

Battery Replacement

Remove screw from battery compartment cover on back of meter and remove cover. Replace battery with a fresh 9 Volt battery paying attention to polarity position. Replace cover and screw.

Troubleshooting

Power on but no display	Press the power key more than 3 seconds
	Replace the battery and try again
	Remove the battery and wait one minute
	Reinstall and try again
E1	The probe is not connected or damaged
E2	The value is underflow
E3	The value is overflow
E4	The original data that is relative to this value has an error
E5	Out of meter display range
E6	The value is not calculated completely
E11	Humidity Calibration error

Specifications

Temperature	-4° to 140°F (-20° to 60°C) Accuracy: ±1°F (+0.6°C) Resolution: 0.1°F (0.1°C)
Relative Humidity	0 to 100% RH Accuracy: ±3% at 10 to 60% RH ±5% at other range Resolution: 0.1%
Dew Point	-90° to 158°F (-68° to 70°C) Accuracy: ±3% at 10 to 60% RH ±5% at other range Resolution : 0.1°
Wet Bulb Temperature	-7.6° to 158°F (-22° to 70°C) Accuracy: ±3% at 10 to 60% RH ±5% at other range Resolution : 0.1°
Air Velocity	0.3 to 35 m/s (1 to 114 ft/s) Accuracy: ±5% Resolution : 0.1° m/s
Air Volume	0 to 99999 m ³ /s (0 to 99999 cfm) Accuracy: ±5% Resolution: 0.1 (0 - 9999.9) or 1 (10000 - 99999)
Power	(1) 9V Alkaline battery or 9V > 200mA adapter
Dimensions	Meter: 175 x 70 x 33 mm Vane: 170 x 77 x 40 mm



DAFM3

Digital Air Flow Meter

Limited Warranty

The DAFM3 is warranted to be free from defects in materials and workmanship for a period of one year from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

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This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

